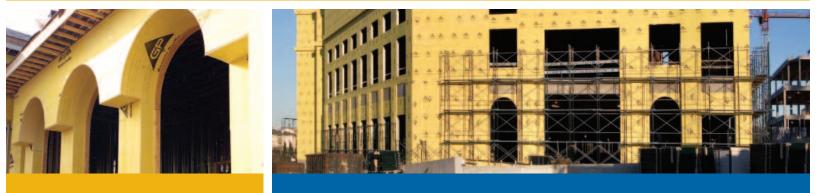






Preferred substrate under brick, stone, stucco, siding and Exterior Insulation and Finishing Systems (EIFS).



MOISTURE- AND MOLD-RESISTANT HIGH-PERFORMANCE SOLUTIONS



Product Overview

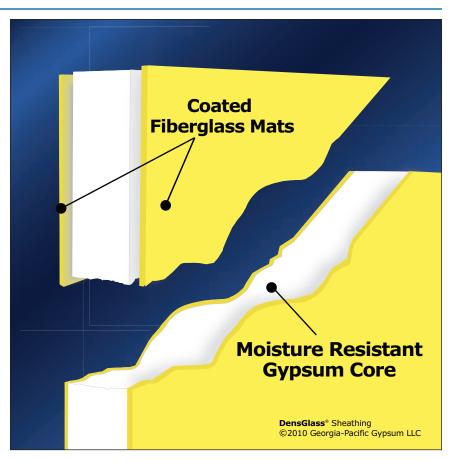


Table of Contents

Product Overview2
Physical Properties
Installation Recommendations 5
Wall Applications 5
Fastening and Framing 7
Negative Uniform Lateral Loads
Soffit Applications, Fastening, Framing and Finishing 8
Soffit Board Comparison 9
Air- and Water-Resistive Barriers 9
Protection of Penetrations 9
Fire-Rated Assemblies (Wood-Framed)
Fire-Rated Assemblies (Steel-Framed)
Architectural Specifications 13
Limitations
Commonly Used Metric Conversions

DensGlass[®] Sheathing has fiberglass mats for superior mold and moisture resistance compared to paper-faced sheathings.

- Fiberglass mats eliminate a potential food source for mold and may reduce remediation and scheduling delays associated with paper-faced drywall.
- Replaces traditional paper-faced sheathing.
- Backed with a 12-month limited warranty against in-place weather exposure damage (delamination, deterioration and decay).*

*For complete warranty details, visit www.gpgypsum.com

When tested, as manufactured, in accordance with ASTM D 3273, DensGlass Sheathing scored a 10, the highest level of performance for mold resistance under the ASTM D 3273 test method.

The score of 10, in the ASTM D 3273 test, indicates no mold growth in a 4-week controlled laboratory test. The mold resistance of any building product when used in actual job site conditions may not produce the same results as were achieved in the controlled, laboratory setting. No material can be considered mold proof. When properly used with good design, handling and construction practices, Dens[™] Brand gypsum products provide increased mold resistance compared to standard paper-faced wallboard.

Available Sizes/Dimensions

DensGlass Sheathing is available in 1/2" (12.7 mm) thickness and DensGlass® Fireguard® Sheathing is available in 5/8" (15.9 mm) thickness. DensGlass Sheathing is manufactured in a 4' (1219 mm) width and 8' (2438 mm), 9' (2743 mm) and 10' (3048 mm) lengths. Other lengths are available upon request.



DensGlass[®] Sheathing is the preferred substrate under brick, stone, stucco, siding and Exterior Insulation and Finishing Systems (EIFS) because of its exemplary track record. DensGlass Sheathing should be specified for any project where flexibility and easy sheathing installation are paramount without the headaches and expense of delamination, deterioration, sagging and warping. Look for the distinctive GOLD color to ensure you're using genuine DensGlass Sheathing.

Mold Resistance

Independent tests confirm that DensGlass Sheathing, with its patented fiberglass mat design, resists the growth of mold when tested, as manufactured, per ASTM D 3273.

Strength

Fiberglass mats penetrate into the panel to make an integrated unit that offers superb strength; outstanding resistance to delamination, deterioration, warping and job site damage; and an excellent bonding surface for EIFS. The flexural strength of DensGlass Sheathing is approximately the same in both directions. This means DensGlass Sheathing can be installed either vertically or horizontally without sacrificing wall strength between studs. DensGlass panels also protect and help stabilize structural framing.

Stability

DensGlass Sheathing is extremely resistant to rippling, buckling and sagging, even under humid conditions — which makes it particularly suitable for soffits. In actual tests, DensGlass panels exceeded ASTM C 1396 and ASTM C 79 standards for humidified deflection by a factor of five times over the standard for paper-faced gypsum sheathing.

Fire Resistance

DensGlass Sheathing is noncombustible as described and tested in accordance with ASTM E 136. Tests of 5/8" (15.9 mm) DensGlass® Fireguard® Sheathing conducted in accordance with ASTM E 119/CAN ULC S-101 qualify the product for a variety of UL listings and other designs in the GA-600 Fire Resistance Design Manual.

Superior Weather Protection

DensGlass Sheathing integrates a water-resistant, treated core with a fiberglass mat face and back to provide superb protection from the elements. Panels will not delaminate or deteriorate due to normal weather conditions — even during construction delays that last as long as 12 months after installation.

A water-resistive barrier is not required over DensGlass Sheathing to provide for the protection of the gypsum sheathing itself. Consult with the local building code, design professional, owner or cladding manufacturer for water-resistive barrier requirements. DensGlass Sheathing is the ideal substrate for a wide variety of air and water-resistive barriers including building wraps, liquid applied coatings and self-adhering membranes. See page 9 for details.

Easy to Handle

DensGlass Sheathing is lightweight and easy to handle. It can be cut and fastened with standard drywall tools and fasteners. The product is much easier to work with than wood substrate, cement board or fiber cement sheathing, which tend to be heavy and bulky.

Outstanding Warranty

DensGlass Sheathing is covered by a 12-month limited warranty for weather exposure, a five-year limited warranty against manufacturing defects and a 12-year limited warranty when used as a substrate for architecturally specified EIFS. For a copy of the limited warranty, call 1-800-225-6119. Or visit our Web site at www.gpgypsum.com.

Standards and Code Compliance

DensGlass Sheathing is manufactured to meet ASTM C 1177. Application standards where applicable are in accordance with Gypsum Association Publication GA-253 for gypsum sheathing or ASTM C 1280.

Evaluated by:

- ICC-ES Legacy Report NER 574
 CCN
- CCMC-12064-R
- ICC-ES Legacy Report ER 4305

- N.Y. City MEA 244-88-M
- Florida Product Approval Code FL 2524-R3

The data relating to fire- and sound-tested assemblies is based on the characteristics, properties and performance of materials and systems obtained under controlled test conditions as set forth under the appropriate ASTM standard, such as E 119 (fire), E 90 (sound) or E 72 (structural).

Georgia-Pacific Gypsum Products and LEED®

Many of our products may contribute to LEED[®] credits. To find out more, please reference the Sustainable Materials Data Sheets (SMDS) on our website (www.gpgypsum.com) for recycled content, regional materials, low emitting materials and other potential categories for LEED credit contributions.



Physical Properties

Product Comparison	5/8" (15.9 mm) DensGlass® Fireguard®	5/8" (15.9 mm) Gypsum Sheathing, Type X (Paper-faced)	1/2" (12.7 mm) DensGlass Sheathing	1/2" (12.7 mm) Regular Gypsum Sheathing (Paper-faced)
Width, Nominal	4' (1219 mm)	4' (1219 mm)	4' (1219 mm)	4' (1219 mm)
Length, Standard	8', 9', 10' (2438, 2743, 3048 mm) ± 1/4" (6 mm)	8′, 9′, 10′ (2438, 2743, 3048 mm) ± 1/4″ (6 mm)	8', 9', 10' (2438, 2743, 3048 mm) ± 1/4" (6 mm)	8′, 9′, 10′ (2438, 2743, 3048 mm) ± 1/4″ (6 mm)
Weight/Ibs/SF (kg/m ²)	2.5 (12)	2.2 (11)	1.9 (9)	1.9 (9)
Bending Radius	8' (2438 mm) ⁸	n/a	6′ (1829 mm) ⁸	n/a
Composition	Fiberglass mats gypsum core	Paper facings gypsum core	Fiberglass mats gypsum core	Paper facings gypsum core
Racking Strength, Ibs./ft. (dry) (N/m) (Ultimate – not design value)	>654 ⁹ (>9544)	654 ¹ (9544)	>540° (>7878)	540 ¹ (7878)
Flexural Strength, ⁴ parallel, lbf. (N) (4' weak direction)	1007 (445)	50 ² (222)	80 ⁷ (356)	40 ² (178)
Compressive Strength	min. 500 psi (3445 kPa)	min. 400 psi (2750 kPa)	min. 500 psi (3445 kPa)	min. 350 psi (2400 kPa)
Humidified Deflection, ^{3,4,7} inches	1/8" (3 mm)	5/8" (15.9 mm)	2/8" (6 mm)	10/8" (32 mm)
Permeance (perms) ⁵ [ng/Pa•s•m ²]	17 [970]	25 [1400]	23 [1300]	27 [1600]
"R" Value ⁶ °F•ft ² •hr/BTU (K•m ² /w)	.67 (0.118)	.56 (0.099)	.56 (0.099)	.45 (0.079)
Combustibility ¹⁰	Noncombustible	Combustible	Noncombustible	Combustible
Linear Expansion with Change Moisture in/in/%RH(mm/mm %RH)	6.25 x 10 ⁻⁶	7.5 x 10 ⁻⁶	6.25 x 10 ⁻⁶	7.5 x 10 ⁻⁶
Flame Spread, E84 CAN ULC-S102	10	15	10	15
Coefficient of Thermal Expansion	8.5 x 10 ⁻⁶	10 x 10 ⁻⁶	8.5 x 10 ⁻⁶	10 x 10 ⁻⁶
in/in/°F (mm/mm/°C)	(15.3 x 10⁻6)	(18 x 10 ⁻⁶)	(15.3 x 10⁻⁶)	(18 x 10 ⁻⁶)
Resists Growth of Mold (tested, as manufactured, per ASTM D 3273)	Yes	No	Yes	No
Handling Characteristic	Scores with utility knife and snaps easily	Scores with utility knife and snaps easily	Scores with utility knife and snaps easily	Scores with utility knife and snaps easily
Fasteners	Standard	Standard	Standard	Standard

1. Gypsum Association – GA-253

2. Minimum requirements for ASTM C 1396 3. Maximum requirements for ASTM C 1396 6. Tested in accordance with ASTM C 518 (heat flow meter) 7. Minimum requirements for ASTM C 1177

8. Double fasteners on ends as needed

Tested in accordance with ASTM C 473
 Tested in accordance with ASTM E 96 (dry cup method)

9. Tested in accordance with ASTM E 72
10. As defined and tested in accordance with ASTM E 136

CAUTION: For product fire, safety and use information, go to gp.com/safetyinfo.



Installation Recommendations

- DensGlass[®] Sheathing must be installed in accordance with the instructions in this brochure, Gypsum Association document GA-253 or ASTM C 1280. DensGlass Sheathing can be attached parallel or perpendicular to wood or metal framing. Use appropriate board orientation for specific fire assemblies and shear wall applications within this document, other reference documents or as required by designing authority. The framing width shall not be less than 1-1/2" (38 mm) wide for wood framing and 1-1/4" (32 mm) for steel framing. Framing members shall not vary more than 1/8" (3 mm) from the plane of the faces of adjacent framing.
- Fasteners should be driven flush with the panel surface (not countersunk) and into the framing system. Locate fasteners at least 3/8" (9 mm) from the ends and edges of the sheathing. Nails or screws, as listed in the fastener chart, may be used to attach DensGlass Sheathing to framing. When a pneumatic fastening system into metal is specified to attach DensGlass Sheathing, consult with manufacturer for application specifications and shear resistance data. DensGlass Sheathing is not to be used as a base for nailing or other fastening.
- Install DensGlass Sheathing with end joints staggered on horizontal applications. Ends and edges of the sheathing should fit tightly. DensGlass Sheathing panels shall not be less than 8" (203 mm) from the finish grade in fully weather- and water-protected siding systems, and not less than 12" (305 mm) from the ground for properly drained and ventilated crawl spaces. Consult with the design authority for control joint recommendations.

Wall Applications

Installing Cladding over DensGlass Exterior Sheathing

Most conventional exterior sidings and wall coverings — including wood, vinyl, composition, metal, stone, brick, wood shingles, shakes and plywood panels — may be applied over DensGlass Sheathing. Consult your local building codes for water resistive barriers (WRB) requirements.

- A. DensGlass Sheathing
- B. Insulation
- C. Framing
- D. Water-Resistive Barrier
- E. Masonry Tie
- F. 2" (50mm) Max. Air Space

Brick Cavity Wall

Masonry or stone veneer can be applied over DensGlass Sheathing just as it would be over any other type of sheathing. Attach the masonry ties securely through the panels and into the steel or wood framing. Space the ties as required by masonry courses. Apply water-resistive barrier as required by building code or design authority.

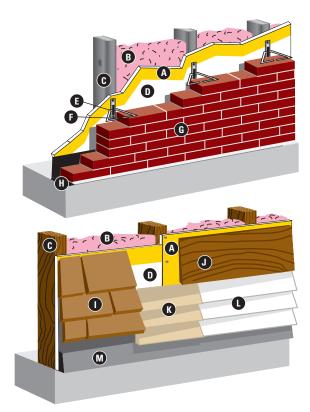
Shingles, Shakes, Vinyl, Metal, Wood, Fiber Cement Siding

DensGlass Sheathing can be used in applications such as under wood shakes or shingles, plywood panel siding or other horizontal siding applications. All siding must be attached through the DensGlass Sheathing and into the steel or wood framing. Apply water-resistive barrier as required by building code or design authority.

Illustrations not intended for design or specification purposes.

- G. Brick Masonry or Stone Veneer
- H. Flashing and Weeps
- I. Wood Shingles or Shakes
- J. Plywood Siding
- K. Vinyl Siding

- L. Fiber Cement Siding
- M. Metal Siding



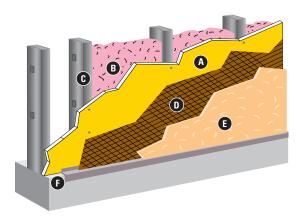


Wall Applications continued

- A. DensGlass® Sheathing
- B. Insulation
- C. Framing
- D. Paper-Backed Metal Lath
- E. Conventional Stucco
- F. Minimum 1/4" (6 mm) Gap

Conventional Stucco

Stucco systems may be applied over DensGlass Sheathing using paper-backed metal lath. Paper-backed metal lath must be mechanically attached through the DensGlass Sheathing into the steel or wood framing. Install stucco system in accordance with the manufacturer's instructions, the Portland Cement Association guidelines and local building code requirements.

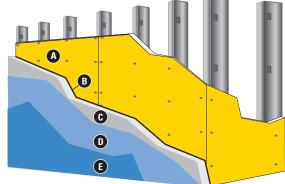


Exterior Insulation and Finish Systems (EIFS)

DensGlass Sheathing is an ideal substrate for adhesive or mechanical application of expanded polystyrene (EPS) or extruded polystyrene insulation in EIFS applications and is recommended for all climate zones.

DensGlass Sheathing is designated as the preferred gypsum substrate for EIFS by EIMA, the EIFS industry members association, in the EIFS Durability Specifications Guideline. DensGlass panels are treated with an exclusive GOLD color primer coating. This coating, proprietary to Georgia-Pacific Gypsum and developed especially for DensGlass Sheathing, has several important advantages for EIFS applications:

- Eliminates the need for sealer/primer with adhesively applied EIFS.
- Strengthens the bond between panel and surfacing product.
- Makes the panel more resistant to surface water. The result: labor cost and callbacks go down while customer satisfaction on each project goes up.
- 12-year limited warranty when used in an architecturally specified EIFS application.
- Maximum framing spacing 16" (406 mm) o.c. for 1/2" (12.7 mm) and 24" (610 mm) o.c. for 5/8" (15.9 mm) DensGlass® Fireguard® Sheathing.
 - A. DensGlass Sheathing
 - B. Adhesive or Mechanically Attached
 - C. Polystyrene Insulation
 - D. Reinforcing Mesh Embedded in Base Coat
 - E. Finish Coat



High Velocity Hurricane Zone (HVHZ)

The ability to withstand the destructive winds and the impact of various objects during a hurricane in a coastal area is key to the survival of any exterior cladding system. DensGlass Sheathing from Georgia-Pacific Gypsum helps BASF, Sto Corp, Dryvit, Parex Lahabra, Inc., Fiberweb, Inc. and Wellbilt International's systems pass the strict Miami-Dade County and Florida Building Code requirements for High Velocity Hurricane Zones (HVHZ). The systems were tested independently to determine the performance against specific criteria for impact resistance, air and water infiltration resistance and wind load resistance. For more information, please visit www.gpgypsum.com or contact the system manufacturer.



Fastening and Framing

Thickne	ess	Framing Spacing	Panel Orientation	Fastener Spacing – Wood Framing ⁴	Fastener Spacing – Metal Framing ⁴
1/2" (12	2.7 mm)	24" (610 mm) o.c. max ^{1, 3}	Parallel ³ or Perpendicular	8" (203 mm) o.c. field ² & perimeter	8" (203 mm) o.c. along framing
5/8" (15	5.9 mm)	24" (610 mm) o.c. max ³	Parallel ³ or Perpendicular	8" (203 mm) o.c. field ² & perimeter	8" (203 mm) o.c. along framing

1. Only for mechanically attached claddings. When specified behind EIFS, maximum framing spacing for 1/2" (12.7 mm) DensGlass[®] Sheathing is 16" (406 mm) o.c. 2. Fastener spacing around the perimeter of the wall and along intermediate vertical framing members. To meet the racking shear strength listed in the physical

properties table, fastener spacing is 4" (102 mm) o.c. around the perimeter of each panel and 8" (203 mm) o.c. along vertical framing members.

3. For racking strength resistance apply panel edges parallel with framing spaced a maximum of 16" (406 mm) o.c. for both 1/2" (12.7 mm) and 5/8" (15.9 mm) DensGlass Sheathing.

4. Fire-rated assemblies may require additional fasteners, see specific assembly details.

Fastener*	Length		Description	Application
	1/2" Thick	5/8" Thick		
	1″ (25 mm)	1-1/4" (32 mm)	Bugle head fine thread, rust-resistant drill point drywall screw	DensGlass Sheathing to heavy-gauge steel
X	1" (25 mm)	1-1/4" (32 mm)	Bugle head fine thread, rust-resistant sharp point drywall screw	DensGlass Sheathing to light- gauge metal framing furring
X	1-1/4" (32 mm)	1-5/8" (41 mm)	Bugle head, rust-resistant, coarse thread sharp point screw	DensGlass Sheathing to wood framing
	1-1/4" (32 mm)	1-1/4" (32 mm) metal 1-5/8" (41 mm) wood	Wafer head, rust-resistant screws, drill or sharp point	DensGlass Sheathing to heavy-gauge or light-gauge, metal or wood, respectively
	1-1/2" (38 mm)	1-3/4" (45 mm)	11-gauge, galvanized nail	DensGlass Sheathing to wood framing or equivalent

*For screws, meet or exceed ASTM C 1002 or C954. Contact fastener manufacturer for correct amount of corrosion resistance.

Negative Uniform Lateral Loads (Wind Load)

5/8" (15.9 mm) DensGlass® Fireguard® Sheathing Horizontally Applied

Stud Spacing, In./O.C. (mm)	Screws, In./O.C. (mm)	Ultimate load, PSF* (kPa)
16 (406)	8 (203)	127 (6.08)
16 (406)	6 (152)	142 (6.80)
16 (406)	4 (102)	192 (9.19)
12 (305)	8 (203)	157 (7.51)
12 (305)	6 (152)	204 (9.77)
12 (305)	4 (102)	270 (12.93)
8 (203)	8 (203)	208 (9.96)
8 (203)	6 (152)	354 (16.95)
8 (203)	4 (102)	410 (19.63)

NOTE: Apply DensGlass Sheathing to appropriately engineered framing system. Tested applied to 6" (152 mm) x 1-5/8" (41 mm) 18-gauge (43 mils) steel studs using #6 1-1/4" (32 mm) bugle head screws. Other stud sizes may be suitable. Source: Tested in accordance with ASTM E 330 by Hurricane Test Laboratory. For a copy of report #G488-1001-07, contact Georgia-Pacific Gypsum Technical Hotline at 1-800-225-6119. *Maximum load capacity (not design load) of the 5/8" (15.9 mm) DensGlass Fireguard

Sheathing applied horizontally. Apply appropriate safety factor from the design method used to calculate design load. For example, a safety factor of 3 applied to an ultimate load of 127psf (6.08 kPa) results in a design load of 42 psf (2.01 kPa).

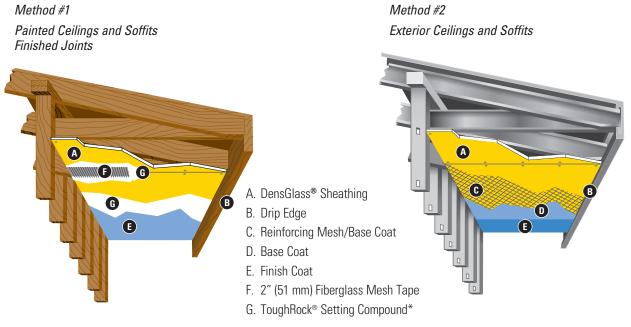
1/2" (12.7 mm) and 5/8" (15.9 mm) DensGlass Fireguard Sheathing Vertically or Horizontally Applied

Thickness Inches (mm)	Board Orientation	Stud Spacing in. o.c. (mm)	Ultimate Load Psf (kPa)
1/2" (12.7)	Vertical	16 (406)	65 (3.11)
1/2" (12.7)	Horizontal	16 (406)	70 (3.35)
5/8" (15.9)	Vertical	24 (610)	68 (3.26)
5/8" (15.9)	Horizontal	24 (610)	85 (4.07)
5/8" (15.9)	Vertical	16 (406)	92 (4.40)

Source: TPI Report #89-047; wind load per ASTM E330 (bugle head screws 8" (203 mm) o.c.)



Soffit Applications, Fastening, Framing and Finishing



*Sandable setting compounds are not recommended.

Thickness	Framing Spacing	Orientation	Screw Spacing
1/2" (12.7 mm)	16" (406 mm) o.c. max	Parallel or Perpendicular	8" (203 mm) o.c. along framing
1/2" (12.7 mm)	24" (610 mm) o.c. max	Perpendicular 24" o.c. framing	8" (203 mm) o.c. along framing
5/8" (15.9 mm)	24" (610 mm) o.c. max	Parallel or Perpendicular	8" (203 mm) o.c. along framing

Method #1

Embed 2" (51 mm) wide fiberglass mesh tape in ToughRock[®] 90 Setting Type joint compound, or equivalent, over all joints. Once dry, apply a skim coat of ToughRock 90 setting compound, or equivalent, over the panels to achieve a uniform, smooth finish over the entire area. Prime with exterior-grade primer and finish with two coats of exterior-grade paint.

Method #2

Apply a synthetic-type Direct Applied Finish System in accordance with the coating manufacturer's recommendation.

Special Conditions:

- 1. Control joints are recommended a maximum of 30 feet (9144 mm) or closer as specified by the design authority.
- 2. The roof must be dried in or protection from the elements must be provided prior to installing DensGlass Sheathing in horizontal applications to prevent moisture from ponding or settling on top of the sheathing panel or within the finished soffit.
- 3. Sandable setting compounds are not acceptable for use over DensGlass Sheathing in exterior soffit applications.
- 4. Georgia-Pacific Gypsum's ToughRock 90 setting compound is not available in all markets. It is permissible to use setting-type joint compounds from other manufacturers that are equivalent to ToughRock 90 setting compound.



Soffit Board Comparison

Product Comparison	1/2" (12.7 mm) DensGlass®	1/2" (12.7 mm) Gypsum Soffit Board (Paper-faced)	5/8" (15.9 mm) DensGlass Sheathing	5/8" (15.9 mm) Gypsum Soffit Board (Paper-faced)
Humidified Deflection ¹ (Sag)	2/8" (6 mm)	7/8" (22 mm)	1/8" (3 mm)	4/8" (13 mm)
Water Absorption ¹	<10%	40%	<10%	40%
Surface Water Absorption ¹	.83 grams	2.5 grams	.83 grams	2.5 grams
Surface	Fiberglass mat	Paper-faced	Fiberglass mat	Paper-faced

1. Specified values for DensGlass Sheathing are found in ASTM C 1177, ASTMC 1396 and ASTM C 931 for gypsum soffit board, tested in accordance with ASTM C 473.

Air- and Water-Resistive Barriers

The need for moisture control, greater energy savings, comfort and improved environment is driving the use of air- and waterresistive barriers. Manufacturers, building codes and standards organizations are improving the ways moisture is controlled in buildings. DensGlass® Sheathing has been widely accepted for years as the preferred substrate with these systems and provides superior performance over other sheathings. The ultimate in wall performance and peace of mind is starting with the best substrate – DensGlass Sheathing.

DensGlass Sheathing is a superior substrate for a wide variety of air and water-resistive systems which include:

- #15 asphalt felt, ASTM D 226, type 1 or equivalent
- Synthetic wraps such as Tyvek®, Typar® MetroWrap®, ASTM E 1677 or equivalent
- Liquid- or fluid-applied air or vapor barriers such as Tremco ExoAir[®] 120, Grace Perm-A-Barrier[®] VP, Henry Air-Bloc[™] 32 or Carlisle Barriseal[®]
- Water barrier systems such as Sto Guard[®] as manufactured by Sto Corp., Dryvit's Backstop[®] NT, Prosoco R-GUARD[™] or equivalent
- Asphalt-based coatings
- Self-adhering membranes such as Carlisle CCW, Grace Perm-A-Barrier®, Henry Air-Bloc Vapor Barriers, Protecto Wrap
- Water-resistive barrier and drainage membranes such as DELTA-DRY®

Follow manufacturer's installation recommendations for use with DensGlass panels, local building code requirements and design authority's specifications.

Note: It is not required to provide a water-resistive barrier over DensGlass Sheathing for the protection of the gypsum sheathing itself during the 12-month weather exposure limited warranty. Consult with local building code, design professional, owner or cladding manufacturer for water-resistive barrier requirements and compatibility with the wall cladding.

Protection of Penetrations

All penetrations should be protected to prevent air and water infiltration. Follow building code, door/window manufacturer, or design authority's recommendations for flashing around openings, abutments to dissimilar materials and wall terminations.

In areas that do not prescribe to current code requirements but still require long-term joint protection, either of the following two methods may be specified in lieu of an air- and water-resistive barrier system: **Method 1**) Apply minimum 3/8" (9 mm) bead of sealant to joints and trowel to provide a layer approximately 2" (51 mm) wide by 1/16" (2 mm) thick spanning the joint. Use backer rod for openings larger than 1/8" (3 mm). **Method 2**) Apply glass mesh joint tape to all joints, overlapping at intersections by the width of the tape. Apply approximately 3/8" (9 mm) bead of caulk along the joint. Embed the caulk into the entire surface of the tape with a trowel. Use backer rod for openings larger than 1/8" (3 mm). Follow manufacturer's installation recommendations for use with DensGlass Sheathing, and design authority specifications.

A variety of caulk and polymer-based "fill" materials may be specified, including GE, Dow Corning, Tremco, Sto, Dryvit, BASF and Proseco. Please contact the caulk manufacturer for its recommended caulks over DensGlass Sheathing.



Fire-Rated Assemblies (Wood-Framed)¹ continued

Design assemblies for illustrative purposes only. Consult appropriate fire resistance directory for assembly information. See Fire Safety Caution on back panel.

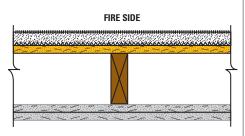
1-Hour Fire Rating	Test Reference: UL U305, U337, WHI 495-0702, ULC W301, GA WP 5515
EXTERIOR	Wall Thickness: 4-7/8" (124 mm)
	Weight per Sq. Ft.: 7.5 (37 kg/m ²)
	Exterior: 5/8" (15.9 mm) DensGlass [®] Fireguard [®] Sheathing applied parallel (U337, W301, U305) or at right angles (U305) to 2 x 4 wood studs 16" (406 mm) o.c. with 1-3/4" (45 mm) galvanized roofing nails 7" (178 mm) o.c. for all framing members. Exterior surface covered with weather exposed cladding or finish system.
	Interior: 5/8" (15.9 mm) DensArmor Plus [®] Fireguard [®] interior panels or 5/8" (15.9 mm) ToughRock [®] Fireguard [®] gypsum board applied parallel or at right angles to studs with 1-7/8" (48 mm) 6d coated nails 7" (178 mm) o.c. Stagger joints each side. (Load-bearing)
1-Hour Fire Rating	Test Reference: UL U309, cUL U309
EXTERIOR	Wall Thickness: 4-7/8" (124 mm)
	Weight per Sq. Ft.: 7.5 (37 kg/m ²)
	Exterior: 5/8" (15.9 mm) DensGlass Fireguard Sheathing applied parallel or at right angles to 2 x 4 wood studs spaced 24" (610 mm) o.c. with 1-7/8" (48 mm) galvanized roofing nails 7" (178 mm) o.c.
	Interior: 5/8" (15.9 mm) DensArmor Plus Fireguard or 5/8" (15.9 mm) ToughRock Fireguard gypsum board to framing with 1-7/8" (48 mm) 6d coated nails 7" (178 mm) o.c. (Load-bearing)
2-Hour Fire Rating	Test Reference: UL U301, cUL U301
EXTERIOR	Wall Thickness: 6-1/8" (156 mm)
	Weight per Sq. Ft.: 12.5 (61 kg/m ²)
	Exterior: Two layers 5/8" (15.9 mm) DensGlass Fireguard Sheathing applied parallel or at right angles to 2 x 4 wood studs 16" (406 mm) o.c. Base layer attached with 1-7/8" (48 mm) galvanized roofing nails 16" (406 mm) o.c. Face layer attached with 2-3/8" (60 mm) galvanized roofing nails 8" (203 mm) o.c. Stagger joints between layers and on base layer of both sides.
	Interior: Two layers 5/8" (15.9 mm) DensArmor Plus Fireguard or 5/8" (15.9 mm) ToughRock Fireguard gypsum board applied horizontally or vertically to framing. Base layer attached with 1-7/8" (48 mm) 6d cement coated nails 6" (152 mm) o.c. Face layer attached with 2-3/8" (60 mm) 6d cement coated nails 8" (203 mm) o.c. Stagger joints between layers and on base layer of both sides. (Load-bearing)
2-Hour Fire Rating	Test Reference: UL U302, cUL U302, GA WP 8410
EXTERIOR	Wall Thickness: 10-1/8" (257 mm)
	Exterior: One layer $1/2"$ (12.7 mm) DensGlass Sheathing applied parallel or at right angles to studs with $1-3/4"$ (45 mm) galvanized roofing nails 6" (152 mm) o.c. Face layer is $2" \times 4" \times 8"$ (51 mm x 102 mm x 203 mm) clay brick with 1" (25 mm) air space between brick and exterior sheathing. 20-gauge (30 mils) galvanized wire ties attached to each stud with 8d coated nails as described above, located at every sixth course of bricks. (Load-bearing)
	Interior: Two layers 5/8" (15.9 mm) DensArmor Plus Fireguard or 5/8" (15.9 mm) ToughRock Fireguard gypsum board applied parallel or at right angles to 2 x 4 wood studs 16" (406 mm) o.c. Base layer attached with 1-7/8" (48 mm) 6d coated nails 8" (203 mm) o.c. Face layer attached with 2-3/8" (60 mm) coated nails 8" (203 mm) o.c.

¹Load restricted for Canadian applications—see UL Guide BXUV7.



Fire-Rated Assemblies (Wood-Framed)¹ continued

2-Hour Fire Rating



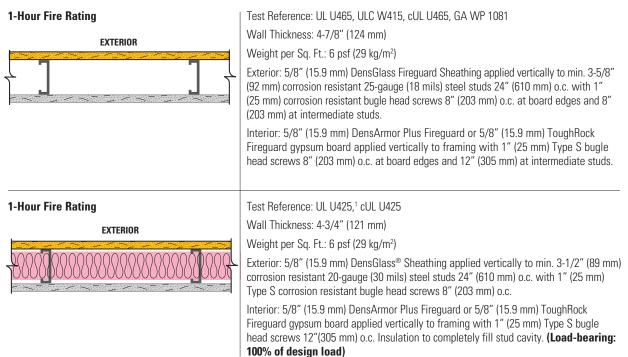
Test Reference: UC 12-21-67, GA WP 8420

Wall Thickness: 8-5/8" (219 mm)

Exterior: Base layer 5/8" (15.9 mm) DensGlass® Fireguard® Sheathing retardant treated 2 x 6 wood studs 16" (406 mm) o.c. with 6d coated nails, 1-7/8" (48 mm) long, 0.0915" (2 mm) shank, 1/4" (6 mm) heads, 12" (305 mm) o.c. and covered with a single layer fire resistant protective weather retarder paper stapled along each edge at 16" (406 mm) o.c. Galvanized self-furring wire mesh applied over sheathing with 8d galvanized roofing nails, 2-3/8" (60 mm) long, 0.113" (3 mm) shank, 9/32" (7 mm) heads, 6" (152 mm) o.c. Cement-stucco applied over wire mesh in two 1/2" (12.7 mm) thick coats with bonding agent applied between coats.

Interior: Base layer 5/8" (15.9 mm) DensArmor Plus[®] Fireguard[®] or 5/8" (15.9 mm) ToughRock[®] Fireguard[®] applied parallel to studs with 6d coated nails, 1-7/8" (48 mm) long, 0.0915" (2 mm) shank, 1/4" (6 mm) heads, 12" (305 mm) o.c. Face layer 5/8" (15.9 mm) DensArmor Plus Fireguard or 5/8" (15.9 mm) ToughRock Fireguard applied at right angles to studs with 8d coated nails, 2-3/8" (60 mm) long, 0.113" (3 mm) shank, 9/32" (7 mm) heads, 8" (203 mm) o.c. at edges and 12" (305 mm) o.c. at intermediate studs. **(Load-bearing)**

Fire-Rated Assemblies (Steel-Framed)

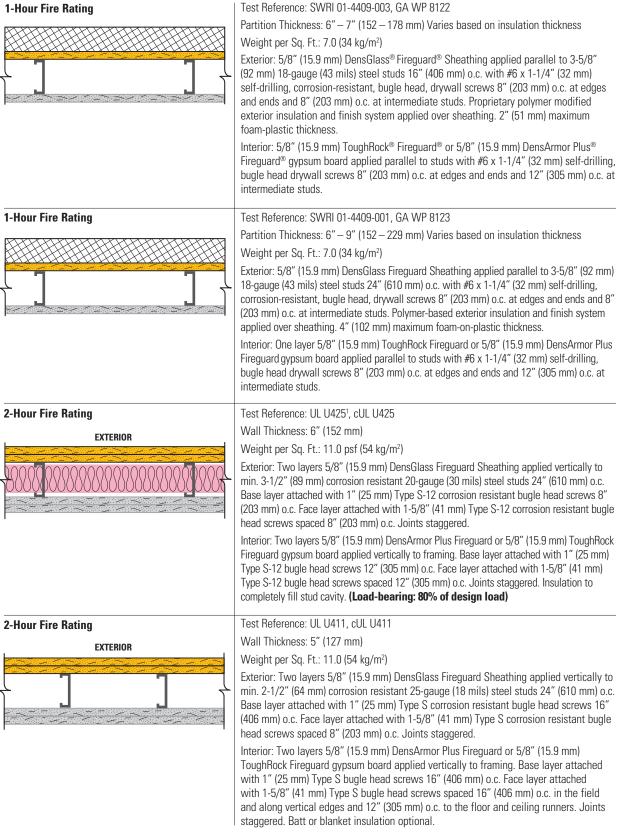


¹Load restricted for Canadian applications—see UL Guide BXUV7.



Fire-Rated Assemblies (Steel-Framed) continued

1-Hour Fire Rating



¹Load restricted for Canadian applications—see UL Guide BXUV7.



Architectural Specifications

Part 1 – General

1.0 Description

Work in this section includes, but is not limited to: wall, ceiling and soffit sheathing.

Related work specified elsewhere:Brick masonryFinish carpentryStoneExterior Insulation and Finish Systems (EIFS)Cold-formed metal framing
Rough carpentrySiding

Joint sealers Light-gauge metal framing Painting

1.1 Submittals

Product Data: Submit manufacturer's descriptive literature indicating material composition, thickness, sizes and fire resistance.

1.2 Quality Assurance

Fire-resistance ratings: Where applicable, provide materials and construction that are identical to those of assemblies whose fire-resistance ratings are indicated.

1.3 Delivery, Storage and Handling

Delivery: Deliver materials to the job site in manufacturer's original packaging, containers and bundles with manufacturer's brand name and identification intact and legible. Product also may be wrapped in temporary factory-applied plastic packaging (plastic wrap) that **must** be removed upon receipt. Reference GA801 for storage information. **Failure to remove the plastic shipping covers and plastic wrap may result in entrapment of condensation or moisture, which may cause application problems.**

Storage and handling: Store flat on a level surface and handle materials to protect against contact with damp and wet surfaces, exposure to weather, breakage and damage to edges. Provide air circulation under covering and around stacks of materials.

Part 2 – Products

2.0 Sheathing Board

Acceptable Products: 1/2" (12.7 mm) DensGlass® Sheathing; 5/8" (15.9 mm) DensGlass® Fireguard® Sheathing

Size: DensGlass Sheathing: 1/2" (12.7mm) thick by 4' (1219 mm) by 8' (2438 mm), 9' (2743 mm) or 10' (3048 mm) (1.9 lb. per square foot) (9.3 kg/m²); DensGlass Fireguard Sheathing: 5/8" (15.9mm) thick x 4' (1219 mm) x 8' (2438 mm), 9' (2743 mm) or 10' (3048 mm) (2.5 lb. per square foot) (12 kg/m²).

Composition: Gypsum sheathing manufactured in accordance with ASTM C 1177 with fiberglass mats both sides and long edges, water-resistant treated core.

Fire resistance: Noncombustible as described and tested in accordance with ASTM E 136 and CAN/ULC-S114.

1/2" or 5/8" (12.7 mm or 15.9 mm) DensGlass Sheathing: Flame spread 10, when tested in accordance with ASTM E 84 and CAN/ULC S-102. 5/8" (15.9 mm) DensGlass Fireguard Sheathing is rated Type X as defined in ASTM C 1177 and can be used as a replacement to any other generic assembly utilizing a 5/8" (15.9 mm) Type X gypsum board (see GA-600 for numeric assemblies). DensGlass Fireguard Sheathing is UL classified, Type DGG, in UL designs G501, G520, G531, L501, L508, L532, L556, L591, N501, N502, N505, N602, P225, P227, P230, P235, P254, P259, P266, P302, P516, P517, P701, P710, P711, P713, P714, P717, P718, P719, P720, P722, P725, P728, P729, P730, P731, P732, P733, P734, P735, P738, P739, P740, P741, P742, P801, P811, P815, P819, P824, P825, P826, P827, P828, S728, S736, U017, U032, U040, U204, U207, U301, U302, U305, U309, U326, U329, U330, U332, U337, U338, U339, U341, U342, U351, U354, U355, U356, U357, U358, U360, U364, U369, U379, U411, U418, U420, U425, U434, U436, U439, U442, U449, U450, U460, U465, U467, U473, U475, U487, U494, U495, U502, U504, U505, U506, U510, U512, U531, U603, U617, U623, U626, U633, U640, U646, U647, U648, U649, U651, U652, U926, V415, V417, V419, V420, V421, V430, V432, V434, V435, V435, V450, V473, V486, V487, V490, X508, X516, X517, X525, X526, X527, X528, X535, X602, X604 and ULC classified, Type DGG in ULC designs: EW10, EW17, U301, U302, W301, W404, W415, W442 and W465. DensGlass Fireguard Sheathing can be used in UL assemblies where the gypsum board is listed as *Gypsum Board (Classified or Unclassified)* for thicknesses up to 5/8" (15.9 mm).

2.1 Air- and Water-Resistive Barrier

If required by local building code, #15, nonperforated, asphalt saturated felt complying with ASTM D 226, Type 1, synthetic building wraps complying with ASTM E 1677, or other water-resistive barrier system meeting local building code requirements.



2.2 Accessories

Joint tape: 2" (51 mm) wide fiberglass mesh tape, see 3.2.A.

Joint compound: ToughRock® setting-type joint compound, see 3.2.A.

Nails, wood framing: 11-gauge galvanized roofing nails, 1-1/2" (38 mm) min. length for 1/2" (12.7 mm) DensGlass® Sheathing and 1-3/4" (45 mm) length for 5/8" (15.9 mm) DensGlass® Fireguard® Sheathing.

Screws, metal framing: Bugle or wafer head, self-tapping, rust-resistant, fine thread for heavy-steel gauge. Bugle or wafer head, rust-resistant sharp point, fine thread for light-gauge metal framing or furring.

Screws, wood framing: Rust-resistant, bugle or wafer head, coarse thread, 1-1/4" (32 mm) length sharp point for wood.

Part 3 – Execution

3.0 Preparation

Examine subframing; verify that surface of framing and furring members to receive sheathing does not vary more than 1/8" (3 mm) from the placement of faces of adjacent members.

3.1 Sheathing

Provide DensGlass Sheathing where indicated on drawings. Install sheathing in accordance with manufacturer's instructions and applicable instructions in GA-253 and ASTM C 1280.

Install DensGlass Sheathing with GOLD side out.

Use maximum lengths possible to minimize number of joints.

Attach DensGlass Sheathing to wood framing with nails spaced 4" (102 mm) o.c. at perimeter for racking shear resistance; 8" (203 mm) o.c. at perimeter where there are framing supports and where racking shear resistance is not required; and 8" (203 mm) o.c. along intermediate framing in field for both conditions. Unless specified otherwise, attach DensGlass Sheathing to metal framing with screws spaced 8" (203 mm) o.c. at perimeter where there are framing supports; and 8" (203 mm) o.c. along intermediate framing in field. A greater number of fasteners may be specified to obtain specific values.

Drive fasteners to bear tight against and flush with surface of sheathing. Do not countersink. Locate fasteners minimum 3/8" (10 mm) from edges and ends of sheathing panels, tight against and flush with surface of sheathing.

Water-Resistive Barrier: If a water-resistive barrier is required by the local building code, design professional, owner or cladding manufacturer over DensGlass Sheathing, one of the following procedures may be used. Consult building code or design authority for proper application selection. Follow manufacturer's installation recommendations.

- A. Entire exterior face of gypsum sheathing covered with an asphalt impregnated felt or synthetic fiber wrap such as Tyvek[®] Commercial Wrap, or equal.
- B. Liquid applied barriers such as Sto Guard[®] as manufactured by Sto Corp., Dryvit's Backstop[®] NT, Prosoco R-GUARD[™], or equal.
- C. Self adhering membranes.

3.2 Painted Ceilings and Soffits

Soffits must be dried in and protected from the elements during and after installation.

- A. Apply fiberglass mesh joint tape over joints and embed in setting-type joint compound specified. Skim coat surface with setting-type joint compound for smooth finish. Prime and paint with exterior grade, high quality paint.
- B. Apply EIFS with or without insulation; install as recommended by manufacturer.



Limitations

DensGlass[®] Sheathing is resistant to normal weather conditions, but it is not intended for immersion in water. Cascading roof/ floor water should be directed away from the sheathing until appropriate drainage is installed.

Avoid any condition that will create moisture in the air and condensation on the exterior walls during periods when the exterior temperature is lower than the interior. The use of forced air heaters creates volumes of water vapor which, when not properly vented, can condense on building materials. The use of these heaters and any resulting damage is not the responsibility of Georgia-Pacific Gypsum. Consult heater manufacturer for proper use and ventilation. Vapor barrier may also restrict ventilation.

When DensGlass Sheathing panels are used in slanted wall applications, that portion of the wall must be temporarily protected from the elements by the use of a water-resistant barrier prior to application of the cladding. Do not allow water to pond or settle on sheathing. Also, exposed wall ends such as those that may be found in parapets must be covered to prevent water from infiltrating the cavity.

Georgia-Pacific Gypsum does not warrant and is not responsible or liable for the performance of the cladding or exterior systems applied over DensGlass Sheathing. The suitability and compatibility of any system is the responsibility of the system manufacturer or design authority.

Do not laminate DensGlass Sheathing to masonry surfaces; use furring strips or framing.

DensGlass Sheathing is not intended for roof applications. For roof applications, consult our DensDeck® Roof Board brochure.

DensGlass Sheathing is not intended for interior or exterior tile applications. For interior tile applications, consult our DensShield[®] Tile Backer brochure.

DensGlass Sheathing should not be used in lieu of plywood where required.

Do not apply DensGlass Sheathing below grade.

For all installations, design details such as fasteners, sealants and control joints per system specifications must be properly installed. Openings and penetrations must be properly flashed and sealed. Failure to do so will void the warranty.

Do not use DensGlass Sheathing as a base for nailing or mechanical fastening. Fasteners should be flush to the face of the board, not countersunk.

COMMONLY USED METRIC CONVERSIONS				
Gypsum Board Thickness 1/4 in 6 mm 1/2 in 12.7 mm 5/8 in 15.9 mm 1 in 25.4 mm Gypsum Board Width 2 ft 610 mm 4 ft 1219 mm 32 in 813 mm Gypsum Board Length 4 ft 1219 mm 5 ft 1524 mm 8 ft 2438 mm 9 ft 2743 mm 10 ft 3048 mm 12 ft 3658 mm	Framing Spacing 16 in 406 mm 24 in 610 mm Fastener Spacing 2 in 51 mm 2.5 in 64 mm 7 in 178 mm 8 in 203 mm 12 in 305 mm 16 in 406 mm 24 in 610 mm 7 in 178 mm 8 in 203 mm 12 in 305 mm 16 in 406 mm 24 in 610 mm 7 in 5°C 50°F - 10°C 125°F - 52°C			

The Dens[™] Brand of High-Performance Gypsum Products from Georgia-Pacific

DensGlass [®] Sheathing	The original and universal standard of exterior gypsum sheathing offers superior weather resistance, with a 12-month weather exposure limited warranty. Look for the familiar GOLD color.
DensShield® Tile Backer	Acrylic-coated tile backer stops moisture at the surface. Lightweight and strong, built for speed on the job site. IBC/IRC Code Compliant. GREENGUARD listed for microbial resistance.
DensDeck® Roof Boards	Fiberglass mat roof board used as the ideal thermal barrier and cover board to improve resistance to wind uplift, hail, foot traffic, fire, moisture and mold in a broad range of commercial roofing applications. Look for green DensDeck Prime and DensDeck DuraGuard, too.
DensGlass [®] Shaftliner	Specially-designed panels for moisture-prone vertical or horizontal shafts, interior stairwells and area separation wall assemblies. 12-month weather exposure limited warranty. GREENGUARD listed for microbial resistance.
DensArmor Plus [®] High-Performance Interior Panel	High-performance interior panel accelerates scheduling because it can be installed before the building is dried-in. 12-month weather exposure limited warranty. GREENGUARD Indoor Air Quality Certified, [®] GREENGUARD Children & Schools [™] Certified and CHPS [™] listed for low emissions. GREENGUARD listed for microbial resistance.
DensArmor Plus [®] Abuse-Resistant Interior Panel	Same benefits as DensArmor Plus [®] High-Performance Interior Panel with added resistance to scuffs, abrasions and surface indentations. Ideal for healthcare facilities and schools. GREENGUARD Indoor Air Quality Certified, [®] GREENGUARD Children & Schools SM Certified and CHPS [™] listed for low emissions. GREENGUARD listed for microbial resistance.
DensArmor Plus [®] Impact-Resistant Interior Panel	Even greater durability with an embedded impact-resistant mesh for the ultimate resistance in high traffic areas. Ideal for healthcare facilities, schools and correctional institutions. GREENGUARD Indoor Air Quality Certified, [®] GREENGUARD Children & Schools SM Certified and CHPS TM listed for low emissions. GREENGUARD listed for microbial resistance.



U.S.A. Georgia-Pacific Gypsum LLC CANADA Georgia-Pacific Canada, ULC

SALES INFORMATION AND ORDER PLACEMENT

U.S.A. Midwest: 1-800-876-4746 West: 1-800-824-7503 South: 1-800-327-2344 Northeast: 1-800-947-4497

CANADA Canada Toll Free: 1-800-387-6823 Quebec Toll Free: 1-800-361-0486

TECHNICAL HOTLINE U.S.A. and Canada: 1-800-225-6119



Some of our products have been certified by Scientific Certification Systems (SCS), SCS is an internationally recognized third-party evaluation, testing and certification organization. Its program spans a wide cross-section of the economy, including manufacturing and retailing, consumer products, the energy industry, and the home improvement and construction sectors. For details on specific Georgia-Pacific Gypsum products and plants, please contact our Technical Hotline at 1-800-225-6119.

TRADEMARKS -

Unless otherwise noted. all trademarks are owned by or licensed to Georgia-Pacific Gypsum LLC. The **GREENGUARD INDOOR AIR** QUALITY CERTIFIED Mark and the GREENGUARD Children & Schools Mark are registered certification marks used under license through the **GREENGUARD** Environmental Institute. The color PINK and Owens Corning are trademarks of Owens Corning. TYVEK is a registered trademark of DuPont. TYPAR and METROWRAP are registered trademarks of Fiberweb. STO GUARD is a registered trademark of Sto Corp. BACKSTOP is a registered trademark of Dryvit. R-GUARD is a registered trademark of Prosoco. EXOAIR is a trademark of Tremco Incorporated. AIR-BLOC is a registered trademark of The Henry Company. BARRISEAL is a trademark of Carlisle. DELTA-DRY is a trademark of Ewald Dorken A.G. PERM-A-BARRIER is a trademark of W.R. Grace & Co. GE is a registered trademark of General Electric Company. Dow Corning is a registered trademark of Dow Corning Corporation. Percora is a registered trademark of Percora Corporation. BASF is

a registered trademark of BASF. LEED, USGBC and related logo are trademarks owned by the U.S. Green Building Council and are used by permission. Collaborative for High Performance Schools and CHPS are trademarks owned by Collaborative for High Performance Schools Inc.

WARRANTIES, REMEDIES AND TERMS OF SALE –

For current warranty information for this product, please go to www.gpgypsum.com and select the product for warranty information. All sales of this product by Georgia-Pacific are subject to our Terms of Sale available at www.gpgypsum.com.

UPDATES AND CURRENT INFORMATION – The

information in this document may change without notice. Visit our website at www.gpgypsum.com for updates and current information.

CAUTION: For product fire, safety and use information, go to gp.com/safetyinfo or call 1-800-225-6119.

HANDLING AND USE –

CAUTION: This product contains fiberglass facings which may cause skin irritation. Dust and fibers produced during the handling and installation of the product may cause skin, eye and respiratory tract irritation. Avoid breathing dust and minimize contact with skin and eyes. Wear long sleeve shirts, long pants and eye protection. Always maintain adequate ventilation. Use a dust mask or NIOSH/MSHA approved respirator as appropriate in dusty or poorly ventilated areas.

FIRE SAFETY CAUTION -

Passing a fire test in a controlled laboratory setting and/or certifying or labeling a product as having a onehour, two-hour, or any other fire resistance or protection rating and, therefore, as acceptable for use in certain fire rated assemblies/systems, does not mean that either a particular assembly/system incorporating the product, or any given piece of the product itself, will necessarily provide one-hour fire resistance, twohour fire resistance, or any other specified fire resistance or protection in an actual fire. In the event of an actual fire, you should immediately take any and all actions necessary for your safety and the safety of others without regard for any fire rating of any product or assembly/system.